HISTORIC COLUMBIA RIVER HIGHWAY,
MITCHELL POINT TUNNEL & VIADUCT
(Tunnel of Many Vistas)
Troutdale vicinity
Multnomah County
Oregon

HAER No. OR-36-R

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# WRITTEN HISTORICAL AND DESCRIPTIVE DATA


Historic American Engineering Record
National Park Service
Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

# HISTORIC COLUMBIA RIVER HIGHWAY, MITCHELL POINT TUNNEL AND VIADUCT (Tunnel of Many Vistas)

HAER No. OR-36-R

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| Location: | Carried the Historic Columbia River Highway through Mitchell Point, Hood River County, Oregon, east of milepost 58.<br><br>UTM: 10/607660/5061880<br>10/607870/5061920<br>Quad: Hood River, Oreg.--Wash. |
| Date of Construction: | 1915 |
| Engineer: | John Arthur Elliott, locating engineer and designer |
| Builder: | Standifer-Clarkson Co., contractor<br>Charles Nelson and Co., subcontractor |
| Owner: | Oregon State Highway Department |
| Present Use: | None; closed, 1953; destroyed, 1966 |
| Significance: | One of four tunnels constructed on the Historic Columbia River Highway, and one of the earliest examples of highway tunnels in the United States constructed with adits used by motorists for viewing a scenic landscape. |
| Historian: | Robert W. Hadlow, Ph.D., September 1995 |
| Transmitted by: | Lisa M. Pfueller, September 1996 |

## PROJECT INFORMATION

This recording project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The HAER program is administered by the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Division of the National Park Service, U.S. Department of the Interior. The Historic Columbia River Highway Recording Project was cosponsored in 1995 by HABS/HAER, under the general direction of Robert J. Kapsch, Ph.D., Chief, and by the Oregon Department of Transportation (ODOT), Bruce Warner, Region One Manager; in cooperation with the US/International Committee on Monuments and Sites (ICOMOS), the American Society of Civil Engineers (ASCE), and the Historic Columbia River Highway Advisory Committee.

Fieldwork, measured drawings, historical reports, and photographs were prepared under the direction of Eric N. DeLony, Chief of HAER; Todd A. Croteau, HAER Architect, and Dean A. Herrin, Ph.D., HAER Historian. The recording team consisted of Elaine G. Pierce (Chattanooga, Tennessee), Architect and Field Supervisor; Vladimir V. Simonenko (ICOMOS/Academy of Fine Arts, Kiev, Ukraine), Architect; Christine Rumi (University of Oregon) and Pete Brooks (Yale University), Architectural Technicians; Helen I. Selph (California State Polytechnic University, Pomona) and Jodi C. Zeller (University of Illinois, Urbana-Champaign), Landscape Architectural Technicians; Robert W. Hadlow, Ph.D. (ASCE/Pullman, Washington), Historian; and Jet Lowe (Washington, DC), HAER Photographer. Jeanette B. Kloos, ODOT Region One Scenic Area Coordinator; and Dwight A. Smith, ODOT Cultural Resources Specialist, served as department liaison.

Additional information about the Historic Columbia River Highway can be found under the following HAER Nos.:

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| OR-36 | HISTORIC COLUMBIA RIVER HIGHWAY |
| OR-36-A | HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE AT TROUTDALE |
| OR-36-B | HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE (Stark St. Bridge) |
| OR-36-C | HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT VIADUCT |
| OR-36-D | HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT |
| OR-24 | LATOURELL CREEK BRIDGE |
| OR-23 | SHEPPERDS DELL BRIDGE |
| OR-36-E | HISTORIC COLUMBIA RIVER HIGHWAY, BRIDAL VEIL FALLS BRIDGE |
| OR-36-F | HISTORIC COLUMBIA RIVER HIGHWAY, WAHKEENA FALLS FOOTBRIDGE |

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| OR-36-G | HISTORIC COLUMBIA RIVER HIGHWAY, WEST MULTNOMAH FALLS VIADUCT |
| OR-36-H | HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH CREEK BRIDGE |
| OR-36-I | HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH FALLS FOOTBRIDGE (Benson Footbridge) |
| OR-36-J | HISTORIC COLUMBIA RIVER HIGHWAY, EAST MULTNOMAH FALLS VIADUCT (Bridge No. 841) |
| OR-36-K | HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA GORGE CREEK BRIDGE |
| OR-36-L | HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA TUNNEL |
| OR-36-M | HISTORIC COLUMBIA RIVER HIGHWAY, HORSETAIL FALLS BRIDGE |
| OR-49 | MOFFETT CREEK BRIDGE |
| OR-36-N | HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK & EAGLE CREEK VIADUCTS |
| OR-36-O | HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK TUNNEL |
| OR-36-P | HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK BRIDGE |
| OR-36-Q | HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK RECREATION AREA (Forest Camp) |
| OR-36-T | HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER TWIN TUNNELS |
| OR-36-U | HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER CREEK BRIDGE (Bridge No. 498) |
| OR-30 | DRY CANYON CREEK BRIDGE |
| OR-27 | MILL CREEK BRIDGE |
| | |
| OR-56 | COLUMBIA RIVER HIGHWAY BRIDGES |

For shelving purposes at the Library of Congress, Troutdale vicinity in Multnomah County was selected as the "official" location for the various structures in the Historic Columbia River Highway documentation project (HAER No. OR-36).

## HISTORIC COLUMBIA RIVER HIGHWAY

The Pacific Northwest's Columbia River Highway, later renamed the Historic Columbia River Highway (HCRH), was constructed between 1913 and 1922. It is one of the oldest scenic highways in the United States. Its design and execution were the products of two visionaries: Samuel Hill, lawyer, entrepreneur, and good roads promoter and Samuel C. Lancaster, engineer and landscape architect, with the assistance of several top road and bridge designers. In addition, many citizens provided strong leadership and advocacy for construction of what they saw as "The King of the Roads."

Often, the terms "scenic highways" and "parkways" are used synonymously. Scenic highways are best described as those roads constructed to provide motorists with the opportunity to see up-close the landscape's natural beauty. Parkways are roads or streets often associated with city beautiful campaigns prevalent in the United States in the late 19th and early 20th centuries. They were part of a movement to create park-like settings out of wastelands. Many of the scenic highways in the United States are associated with the country's national park system and were built in the years following the First World War.

Beginning in the 1910s and early 1920s, the National Park Service (NPS) began construction of well-engineered paved roads with permanent concrete and masonry bridges and viaducts to make its park sites more accessible to an increasingly mobile tourist population. These included roads such as "Going-to-the Sun Highway" in Glacier National Park and "All-Year Highway" in Yosemite National Park. The Historic Columbia River Highway, unlike many of its counterparts, was constructed through county-state cooperation. It became a state-owned trunk route or highway, part of a growing system of roads that criss-crossed Oregon.

Samuel Hill, once an attorney for James J. Hill and his large railroad empire, and later a Pacific Northwest investor and entrepreneur, was the state of Washington's most vocal good roads' spokesman in the late 19th and early 20th centuries. He promoted good roads at Seattle's Alaska-Yukon-Pacific Exposition in 1905, and shortly thereafter helped to establish the department of highway engineering at the University of Washington. With little success in convincing the Washington State Legislature to fund a major highway along the Washington side of the Columbia River, Hill found more receptive ears and pocketbooks with Oregon lawmakers and Portland area businessmen. Construction began on the HCRH in 1913. By 1922, it was complete, covered in a long-wearing and smooth-riding asphaltic-concrete pavement.[1]

Hill hired Samuel Lancaster, an experienced engineer and landscape architect to design the Historic Columbia River Highway. Lancaster was noted for the boulevards that he created around Seattle's Lake Washington in the first decade of the 20th century as a component of the city's Olmsted-designed park system. In 1909 Lancaster became the first professor of highway engineering in Hill's department at the University of Washington. Lancaster accompanied Hill and others to Paris in 1908 for the First International Road Congress, and afterwards the delegation toured western Europe to learn about continental road-building techniques. Seeing roads in the park-like setting of the Rhine River Valley inspired Hill to build a highway along the Columbia River Gorge. By 1912, Lancaster was conducting road-building experiments at Hill's estate, Maryhill, 100 miles east of Portland on the Washington side of the Columbia. The route they subsequently created was not a parkway, in the truest sense, but instead a scenic highway.[2]

The Columbia River Gorge's natural features distinguish it as the ideal setting. This relationship between the natural landscape and the Historic Columbia River Highway was described best by locating engineer John Arthur Elliott. He wrote, "All the natural beauty spots were fixed as control points and the location adjusted to include them." The road passed several waterfalls and rock outcroppings, including Thor's Heights (Crown Point), Latourell Falls, Shepperd's Dell, Bishop's Cap, Multnomah Falls, Oneonta Gorge and Falls, Horsetail Falls, Wahkeena Falls, and Tooth Rock. Natural features were made an integral component of the HCRH.[3]

According to Lancaster, "There is but one Columbia River Gorge [that] God put into this comparatively short space, [with] so many beautiful waterfalls, canyons, cliffs and mountain domes." He believed that "men from all climes will wonder at its wild grandure [*sic*] when once it is made accessable [*sic*] by this great highway." In addition, the promoters sought to create a route that utilized the most advanced techniques available for road construction. In reflecting on the work's progress, Lancaster acknowledged that because of the country's rugged climate, with its wind and rain and winter weather, it had been "slow and tedious and somewhat more expensive than ordinary work." Nevertheless, he and his associates felt they were accomplishing a worthwhile task because, "for if the road is completed according to plans, it will rival if not surpass anything to be found in the civilized world."[4]

In an more practical light, many observers saw the Historic Columbia River Highway as a lifeline connecting Portland with the many commercial and agricultural areas along the Columbia River. Some even envisioned it as part of a spider web of similarly constructed routes radiating out towards central and eastern Washington, and northern Idaho, meeting routes leading to other parts of the region and nation.

The Historic Columbia River Highway was a technical and civic achievement of its time, successfully mixing sensitivity to the magnificent landscape and ambitious engineering. The highway has gained national significance because it represents one of the earliest applications of cliff-face road building as applied to modern highway construction. Lancaster emulated the European styles of road building in the Columbia River Gorge, while also designing and constructing a highway to advanced engineering standards. Throughout the route, engineers held fast to a design protocol that included accepting no grade greater than 5 percent, nor laying out a curve with less than a 200' turning radius. In rare cases where a tighter curve was used, Lancaster reduced grades and widened pavement. The use of reinforced-concrete bridges, combined with masonry guard rails, guard walls, and retaining walls brought together the new with the old - the most advanced highway structures with the tried and tested. In building the HCRH, Lancaster artfully created an engineering achievement sympathetic to the natural landscape.[5]

In the days before the formation of a comprehensive state highway plan, Multnomah, Hood River, and Wasco counties cooperated, sometimes unwillingly, with the newly-formed Oregon State Highway Commission (1913) in constructing the HCRH. Initially a group of recently elected Multnomah County commissioners, strong supporters of the proposed route, resolved that the highway commission take charge of its road building activities, with access to $75,000 in county tax revenues. Soon crews surveyed the route through Multnomah County and constructed one mile of road.

Boosters stumped for the route's completion to the Hood River County line. Local clubs sent out men and boys for weekend work parties to show public support for the undertaking. One photograph from the period, depicts work parties with picks and shovels in hand and placards such as "Gang No. 7, Portland Ad Club, Stalwarts," or "Gang No. 3, Portland Realty Board, We will ROCK the Earth." The highway received much patronage, although some citizens were less than enthusiastic about its construction. Opponents showed their views with placards declaring, "I WON'T WORK, To Hell With Good Roads, We Don't Own Autos." Many "mossbacks" had no use for good roads and were satisfied traveling the network of rutted, narrow, steeply-graded backwoods trails. Nevertheless, the public generally supported the highway's construction. Multnomah County Commissioners levied a direct tax sufficient to fund road building to the Hood River County line, and subsequently, the people voted a $1 million bond issue to pave the road with asphalt.[6]

Other counties similarly supported this scenic highway innovation. In 1914, Hood River County voters approved the sale of $75,000 in bonds to initiate their portion of the road's construction. Finally, in 1915, Wasco County commissioners financed a survey to locate the route through their jurisdiction. By 1916, though, the state highway commission was reorganized and given a greater mandate over state highway construction, taking much of it out of local hands. Passage of the Federal Aid Road Acts of 1916 and 1921 gave the Oregon State Highway Commission matching funding to complete the Historic Columbia River Highway through Wasco County, and eventually to complete the route to its eastern terminus at Pendleton, in Umatilla County, by the early 1920s. At the same time, the state, working with counties west of Portland, completed another portion of the Columbia River Highway to the sea at Astoria. The entire route became part of the national highway system and was designated part of U.S. 30.[7]

By the late 1930s, construction of Bonneville Dam, a New Deal project aimed at providing flood control on the Columbia River and generating electricity, caused a realignment of a portion of the Historic Columbia River Highway near Tooth Rock and Eagle Creek, in eastern Multnomah County. It was evident that the old highway was too outdated to provide safe efficient travel for modern motor traffic. By 1954 it was bypassed in its entirety from Troutdale to The Dalles by a new water-level route. This new road was subsequently upgraded to a four-lane divided roadway and eventually renamed Interstate 84. Only portions of the old route remained as a reminder of its early modern highway engineering accomplishments.

## MITCHELL POINT TUNNEL AND VIADUCT

In 1914 and 1915, the Hood River and Wasco County courts contracted with John Arthur Elliott, a locating engineer, and his crews to prepare a plan and profile of the proposed Historic Columbia River Highway through their counties. Many voters in both counties were reluctant to spend the money on constructing the HCRH, including employing a locating engineer to survey a route. Hood River County only approved its bond issue to cover construction on the condition that local businessman and road supporter Simon Benson would guarantee to make up the difference if costs overran the bond. Indeed, Benson paid at least $13,000 for costs in Hood River County. Many citizens of Wasco County were equally reluctant to spend their own funds on a new highway. They were satisfied with the present county road system which included grades of up to 18 percent on routes between Hood River and The Dalles.[8]

Travel along the Oregon side of the Columbia River from Portland to The Dalles was extremely difficult until construction of the Historic Columbia River Highway from 1913 to 1922. The first road passing along the river between these two points was begun in 1872, when the state of Oregon appropriated $50,000 to begin construction of the Troutdale to The Dalles Road. An additional $50,000 in 1876 furthered construction, but the completed road was narrow, crooked, and steep. In 1883, the Oregon Navigation Company constructed the first long-distance railroad through this section and in the process destroyed and detached many sections of the Troutdale to The Dalles Road. Only a few sections remained as primary local routes for inhabitants and their wagons.

When the HCRH was surveyed through Hood River County in 1914, Elliott continued the philosophy used on the Multnomah County section of the route - maintaining a 5 percent maximum grade and 100' minimum turning radius. He encountered a host of obstacles in designing the Mitchell Point section in Hood River County. There, the old wagon road passed through the saddle between the 400' Little Mitchell Point and the 1,100' Big Mitchell Point at an elevation of 250'. The route included grades between 10 and 23 percent to bring it up to the saddle from near water level. Elliott feared that to carry the HCRH over the same pass he needed to "develop" distance to maintain maximum grade. An alternate water-level route, skirting around Lower Mitchell Point, was impossible because the ORN's successor, the Oregon-Washington Railroad and Navigation Company (OWRN) main line from Portland to points east was located there. Elliott believed that a highway built through the saddle would be much longer, requiring 1½ miles through "a rough and broken country" to reach the saddle, and then 1½ miles down the other side across a shellrock slide. The alignment was poor and came with heavy maintenance expenses. Elliott chose instead to take a shorter, more direct route, but it required finding a location "which would not endanger the railroad and at the same time would not cost excessively." He eventually found his route by cutting a ledge into a cliff, building a viaduct, and tunneling through Lower Mitchell Point.[9]

One news report from July 1915 illustrates just how impassable the old road over the saddle on Mitchell Point was. According to a *Portland Oregon Journal* reporter, several parties of Portlanders and their motorcars ventured out along the Historic Columbia River Highway for a drive to Hood River, even though the old wagon road was still the only passage through the Mitchell Point section. The reporter chronicled most drivers' failure to go further upon reaching Mitchell Point:

> Some machines refused to climb the hill because the oil would settle back in the tank beyond reach of the motors, others had brakes the driver would not trust, but a great many machines were turned back when the man at the wheel took a look at the narrow, winding and rocky path with a wall of rock and gravel on one side and a death dealing abyss on the other.

Elliott saw his plan of a cliff-hugging road, viaduct, and tunnel as the practical solution for ending hair-raising motor travel in the Columbia River Gorge.[10]

Elliott began his field survey of Hood River County on October 11, 1913 and completed it the following spring. He brought with him a locating party of 15 men, consisting of a chief of the party, draftsman, a seven-man transit party, levelman, level rodman, topographer, topog rodman, tapeman, and a cook. Throughout the county, including the Mitchell Point section, they began by running a baseline, or preliminary line, following closely the desired highway location. From this, the party ran levels and noted topography for about 100' on either side of the line. They staked the projected center line, drew maps, and made profiles.[11]

According to Elliott, the party used two methods of location, contour and cross-section. First, the men located lines of equal elevation at 5' intervals. On cliffs they used a second method; they located ground breaks by elevation and distance from the base line.[12]

## DESIGN AND DESCRIPTION

### Alignment

Construction began on the Mitchell Point section of the Historic Columbia River Highway on March 23, 1915. At the western end, the highway's alignment left the wagon road's route. The first challenge from this point was to round a cliff that was too high and too expensive to take out as an open cut. Elliott found that he could hold a line out as far as possible, undercutting the narrowest possible ledge from the cliff for the roadbed (essentially a half-tunnel) and constructing masonry retaining walls to gain width. From there he built a 192' reinforced-concrete slab viaduct over a shellrock talus slope, before then cutting a 390' windowed tunnel through Lower Mitchell Point. From the east portal, the road continued on to rejoin the wagon road's alignment. The total distance of the Mitchell Point section was .84 miles.[13]

<u>The Cliff</u>

At the west end of the Mitchell Point section lay what Elliott believed was the most difficult portion of the project. This involved undercutting the cliff for half the width of the roadbed without jeopardizing the OWRN mainline below. The contractors took great care in preventing damage to the track. Before dynamite blasting ever began, the Western Union telegraph and OWRN communication lines were taken off their poles and buried. Prior to each dynamite blast, the railroad semaphore signals were removed, and the track was protected by covering the rails with ties. Then, the contractor blasted away only small sections of the cliff and hurriedly removed it from the track below between train schedules.

Undercutting the cliff was a long and tedious process because of the need to use only small dynamite shots or only black powder to loosen the rock so that it would fall only to the grade, and carting it away in ore cars. Nevertheless, the contractor spent much time protecting the tracks and removing the small amounts of rock that fell on them so that the OWRN could maintain its schedule. On May 3, 1915, one blast showered the track with so much rock that it took over two hours to clear and also delayed a train. The remaining rock left after the blast was unstable and prone to fall at any moment. The contractor, Standifer-Clarkson, finally convinced the OWRN to permit one large shot to clear the remaining 300 to 500 yards of material and with the help of railroad crews and machinery, cleared the track of the rubble with a minimum of delay for train service along the gorge.[14]

On May 10th, at 12:25 p.m., the big shot was fired. Cut holes loaded with 40 percent dynamite defined the slope. Following closely behind them were lift holes, loaded with 17 kegs of black powder, which lifted much of the cut and dropped it over the cliff on to the OWRN main line, 90' below. The blast covered the tracks with 20' of debris. After an hour of cleaning up it was evident to all involved that the rock would not be cleared by midnight as intended. Work continued all afternoon and into the night, and appeared to be finished at 10:30 the following morning, 22 hours after the blast. Yet, additional rock loosened by the blast continued falling, and a second shot was made to attempt to bring all of it down at once. By then, there were at least 12 passenger trains delayed by the cleanup efforts. After bringing in additional steam shovels, the OWRN eventually cleared the tracks at 11:55 p.m. Wednesday, May 12th. The OWRN and Standifer-Clarkson engaged in a verbal battle for the next month over responsibility for the blast, and in the meantime, other explosions caused more rock fall on the company's main line and delayed more trains.[15]

The Viaduct

Standifer-Clarkson's crews evened up the cut, constructing cement rubble masonry walls, and filling, where needed to even up the road bed. In the meantime, work was progressing on the tunnel, and crews were preparing the talus slope for the viaduct that connected the excavated cliff side with the tunnel. The 192'-0" reinforced-concrete viaduct was a slab and girder type, supported on sets of columns 15'-6" apart center-to-center, and 32'-0" longitudinally. The roadway was 20'-0" curb-to-curb. Crews found it difficult to locate footings because the talus slope was unstable. Excavations were made by hand and proved very time consuming. Cribs were placed and men worked as deep as 65', dumping excavated material into buckets hoisted by hand to the surface by a windlass. Even so, several columns were founded on shellrock, requiring that footings be enlarged from 4'-0" to 5'-0" square. Further complicating matters was the OWRN's easement providing for a 25' width to the toe of the slope at this point. This required sinking footings below the slope of repose of material extending upward from the 25' line.[16]

Because the road line was so close to the OWRN right-of-way at the foot of the slope, there was no level area there for a concreting plant, nor was there enough room at grade level. Standifer-Clarkson solved the problem by building a platform along the toe of the slope, next to the railroad right-of-way, for its cement mixing plant. There, it mixed concrete using aggregate from the tunnel excavations and water pumped from the Columbia. Crews hoisted the concrete in ½ yard buckets about 100' to the road level, where they dumped it into cars that ran along a track to the viaduct site. They also used this method of transport for forms, falsework, and reinforcing steel. It worked smoothly, but the cramped quarters near the railroad main line meant that operations ceased whenever trains passed by.[17]

Standifer-Clarkson's crews were experts at concrete work. On the Mitchell Point Viaduct, they poured the footings, then built up the forms and poured the columns and struts. They took special precautions to ensure that the long column forms were filled without leaving any voids. Similarly, because an expansion joint was included in the design, 128' from the east end, the deck was divided into two pours. The eastern part was the longer and took 38 hours to pour. There was minimal settling of the structure considering the different types of foundation materials that crews encountered with the footing. They used wedges and shims between the falsework and forms to maintain true lines in the deck.[18]

As an adjunct to the viaduct construction, Standifer-Clarkson and John Elliott field-designed a short half bridge to span a portion of the cliff that fell away during the big blast in May 1915. It was not feasible to pour this structure until after they had built the viaduct and completed some nearby grading. The bridge was not in the original plans for this section of the HCRH, and Elliott pulled it together, "using odd steel sizes and lengths on hand."

The Tunnel

Meanwhile, Standifer-Clarkson progressed on tunnel excavations. The bore ran nearly 400' west-east through a portion of the point projecting east of the shell rock slide. As completed it was 18' wide and 19' high at the midpoint of the roadway. The alignment ran a tangent from the west portal to about midway, where it took a 10° curve with a $11\frac{3}{4}$° central angle. Five windows with the same cross-section as the tunnel bore were cut along the cliff face, arranged in a one-three-one formation, with a 50' space between the first and second windows, a 10' space between the second and third, and third and fourth windows, and a 46' space between the fourth and fifth windows. The curvature in alignment was designed for practicality and to increase the light effect in the tunnel. The curve was so slight it was still possible to see through the tunnel from end to end. At the fifth window a trail was constructed leading out 25' along the cliff face for pedestrians to view both the exterior of the tunnel and the river gorge.[19]

The idea for a tunnel with windows, or the "Tunnel of Many Vistas," is attributed to Samuel C. Lancaster, who on a trip with Samuel Hill to the First International Road Congress in Paris in 1908 visited roads throughout western and southern Europe. Of these, the parkways along the Rhine, in Germany, and the Auxenstrasse, on the banks of Lake Lucerne, in Switzerland, most interested him. In particular, he was taken with the Auxenstrasse's long tunnel with its series of windows mostly hewn out of the natural rock to bring light into the tunnel's interior. Shortly after Lancaster returned from Europe, during the 1908-09 academic year, Elliot was one of his highway engineering students and saw his photographs of the Auxenstrasse and likely heard him speak of this tunnel.[20]

In surveying the Historic Columbia River Highway in the Mitchell Point section, Elliott picked the Lower Mitchell Point for a similar design. He hoped to improve upon the Auxenstrasse tunnel, which had pillars between windows built up from masonry, by creating one on the HCRH that had no artificial construction. The natural columns, though, could not be too thick, for Elliot feared the windows might take on the appearance of side tunnels. "If the openings were to convey the idea of windows," he wrote, "they must be seen as such." He also chose a curved alignment rather than a straight bore, because he believed the "the light effect would be lost." The adits would admit a continuous glow during daylight hours, one for which the motorists would not know the source. It was the easiest and most economical alternative.[21]

In his reconnaissance of the tunnel site, Elliott noted indentations in the cliff wall that he believed were "cheap window locations,"and with some testing, he pinpointed the five window openings where he thought they best illuminated the bore. In addition, the bore's curvature was such that drivers approaching the tunnel from either end had a head-on view of the central three windows and the rock columns that separated them. To insure that the firm awarded the excavation contract used care in boring the tunnel and in cutting the adits that Elliot had located, the highway department contract provided a premium for "close work." It allowed a variation of 5 percent from the section that Elliott specified without any price adjustment, while overbreak in excess of 10 percent was not tolerated. So while the tunnel was designed with economics as the first concern, aesthetics and an incentive for accuracy in cutting followed closely behind.[22]

Standifer-Clarkson's crews began the bore by excavating the west portal. Men dangled from ropes attached to the cliff above to support themselves while they cut a working bench, squaring up the cliff and creating a ledge. The material was Columbia River Basalt, with frequent cleavage places, and commonly known as "dice" rock, because it broke up unto small fragments when it was blasted. With the tunnel section 18' wide and with 10' vertical walls, the crown was 19' given an arch radius of 9'. The heading, or top portion of the bore was taken out first, followed by the bench. Blasting crews used extreme care when working near the outside wall and especially in the vicinity of the windows so that they did not cut through the wall or create oversize adits. It was a tedious process that involved the sure skill of an experienced explosives expert. The arrangement of blast holes, and the sequence of explosions, using 40 percent dynamite and black powder was the key to precise boring. According to Elliott, it worked this way:

> At the beginning the entire heading was pulled at ones, but this was abandoned, as the working face neared the windows and the thin outside wall. Here the lower outside lift hole was dropped one round back, leaving each time about 3' of the heading next to the thin wall, thus increasing the effective thickness of the outer wall. This lift hole was always one round behind until all danger of breaking out had been passed. . . . Bad fuse gave some trouble, but danger from this source was avoided by inserting two fuses in the center and cut holes. . . . The firing order was controlled by varying the length of the fuses. Shorter fuses were used in the center, and cut holes and longer fuses in the lift holes. In this way, the center section was broken before the heavier charges in the lift holes exploded, which made the work of the lift holes easier. By holding the outside lift hole back one round, the necessity of breaking to a wall on both sides was eliminated, and the explosives broke out along diagonal lines converging towards the powder charges, which also made the heading easier to break.

Standifer-Clarkson limited hole depth in the heading to 4'. The crews used 1½ sticks of 40 percent dynamite to spring each hole, followed by a per hole charge of 16 to 20 sticks of the dynamite. Each explosive round moved the bore along about 4½'.[23]

After detonating the charges, crews loaded the heading material into horse-drawn muck wagons on tracks and dumped the material out the portal. They also disposed of only a limited amount through the adits because of the OWRN main line's close proximity below. Crews trimmed the roof with picks and hammers after each shot, and then pilled or stripped off the bench. They used two sticks of 40 percent dynamite to spring each hole and followed this with loads of 18 to 22 sticks. Crews loaded the bench material in the same manner as the heading, dumping much of it out the west portal. Once crews broke through from the east portal, they dumped all bench material into a large fill outside of the east portal.[24]

While Standifer-Clarkson crews were cutting the tunnel from west, others were excavating the east portal of 6,100 cubic yards earth, shell rock, and loose rock to reach ledge rock that it bored through in much the same manner as crew did from the west portal. Their procedure was to first cut a trap tunnel along the centerline of the projected bore until they reached the ledge rock. Then, as Elliott explained:

> The trap tunnel was 6' x 6' in cross-section, and was timbered through the mixed material, the roof timbers being placed without fastening. A track was built into the

> tunnel, on which a one-yard car was run. When the trap tunnel was ready for use, a few of the roof timbers were pulled and others placed longitudinal, forming a small hole through which the material fell into the car below. One man with a wide board guarded the hole and stopped the flow of material when the car was loaded. The car ran out onto the dump by gravity, and a horse was used to pull it back. Two men worked up on the slope loosening the material around the hole in the shape of a half funnel. Even the horse learned to perform his act without direction. After pulling one car back with sufficient momentum to carry it into the trap tunnel, he would walk back to the dump, turn around and wait to be hooked onto the second car to come back.

Five men and the horse handled as much as 200 cubic yards a day. Once the men had mucked out the debris, the tunnel crew began driving the heading from the east in the same manner was as the other crew had from the west.[25]

Elliott hoped to take advantage of the natural rock in creating sills for the adits, but after completing the western most window he found that the rail was rough and uneven. As an alternative, he carried on the rubble masonry guard wall theme that was used throughout the Historic Columbia River Highway along the exposed roadway. Stone masons built the rubble walls with semi-circular arched drainage cutouts and a screeded concrete cap in the window openings. According to Elliott, they were "of proportions to give a feeling of security to a driver."[26]

The Mitchell Point Tunnel and Viaduct section of the HCRH opened for traffic in early September 1915. Standifer-Clarkson completed the project on the .84 miles of road on November 25, 1915. The original estimate for this work was $60,000 and the Oregon State Highway Commission appropriated $50,000. To better match the state allocation the alignment was revised and costs projected at $53,104.00. Yet, Standifer-Clarkson's bid was the lowest at $40,343.50. Adding to this $2,500 for engineering and $3,600 for railroad inspection, total costs were about $47,000. This was $3,000 less than the state appropriation.[27]

Mitchell Point Tunnel became known as the "Tunnel of Many Vistas." Samuel Lancaster believed that it was "among the most wonderful pieces of highway construction in the civilized world." Lancaster continued, "It is fully equal to the famous 'Auxenstrasse' of Switzerland and one the great features of the Highway." Indeed, while the Auxenstrasse's tunnel had three windows, the Mitchell Point Tunnel had five.[28]

## REPAIR AND MAINTENANCE

The Mitchell Point Tunnel, like the Oneonta Tunnel and the Mosier Twin Tunnels, all received widespread praise for their construction, and more significantly, for their artistic contribution to the Historic Columbia River Highway. Nevertheless, all three were financial drains on the Oregon State Highway Department because they required almost continuous maintenance. Surrounding unstable basalt formations continually covered tunnel approaches with large rocks, endangering the lives of motorists on what became a heavily traveled road

Traffic density almost from the day Mitchell Point Tunnel opened made it, and the other bores on the Historic Columbia River Highway, dangerous portions of the road. The Historic Columbia River Highway became increasingly popular with the more widespread use of automobiles in the 1920s. By the late 1920s and the 1930s, the development of larger, more powerful cars with improved suspensions and brakes brought even greater numbers of fast-paced drivers to the HCRH. Finally, the advent of motor trucking by the 1930s, and the adoption of the Historic Columbia River Highway as the major trunk route connecting Portland with points east, brought an additional group of drivers to the road. From almost the beginning, the Mitchell Point Tunnel's adits became a traffic hazard as motorists stopped their automobiles along the tunnel to peer out the windows or walk out on the cliff.

Combining the inherent traffic dangers with the real possibilities of pedestrians being struck by falling rock while out on the balcony, the highway department saw the need to barricade the windows. The Union Pacific Railroad became increasingly concerned in the late 1930s about the unstable nature of the rock formations in the tunnel's vicinity. It was especially alarmed at the disintegration of tunnel's window pilasters and feared a complete collapse of the tunnel with rock raining down on its OWRN main line below. The highway department strengthened one of the pilasters with concrete, and it closed one of the windows.[29]

At the same time the department received numerous complaints about the narrow roadway of this tunnel and the others on the HCRH. The highway department considered widening the Mitchell Point Tunnel, but its engineers believed that the already weakened window pilasters were too unstable for any additional excavations. Similar situations were seen at Oneonta Tunnel and at the Mosier Twin Tunnels. At all three, the alternative solution was to install traffic-actuated one-way signals. These signals consisted of customary red-green lights mounted at the portals of the tunnel and tripped by vehicles passing over actuation pads set in the pavement near the portals.[30]

By the late 1940s and early 1950s, the highway department constructed a new water-level route for U.S. 30, bypassing the Historic Columbia River Highway from Troutdale to The Dalles. Much of it was constructed on fill taken from dredgings of the Columbia River. The new route was not a tangent route, but consisted of long, sweeping curves that better accommodated faster traffic, yet still afforded splendid views of the Columbia River Gorge. The section from Troutdale to Dodson completely bypassed the HCRH, leaving this portion of the old road intact for pleasure drivers seeking close-up views of the many waterfalls. Likewise, the portion from Mosier to The Dalles was left intact, but the department sacrificed much of the old road between these two sections for the new alignment.[31]

Even though Mitchell Point Tunnel remained intact after the new route was complete, it was selected for abandonment as part of a discontinuous portion of the Historic Columbia River Highway. The Union Pacific worried about rock fall damage to its main line and finally relocated its tracks out into the river on fill. Likewise, the highway department designed the new water-level route through this section to follow the railroad alignment at the base of Mitchell Point. Before the state could complete the segment of the new U.S. 30 near the tunnel, a portion of the cliff supporting the roadbed near the tunnel's west end collapsed, spelling an early demise for the Mitchell Point Tunnel.[32]

The Oneonta Tunnel had been mothballed in the late 1940s when the railroad and the highway departments both moved their alignments around Oneonta Point. Subsequent to the opening of the new highway, state crews mothballed the Mitchell Point Tunnel and the Mosier Twin Tunnels also by backfilling with rubble. This backfilling was done by dump trucks and caterpillar tractors, with crushed basalt. State Highway Engineer Robert H. Baldock believed that because of safety concerns all of the tunnels on the old highway were a liability to the state and that the best plan was to close them forever.[33]

In December 1954, eighteen months after Mitchell Point Tunnel's closure, highway department officials reported that continual rock fall had littered the closed roadway approaches making it nearly impossible to walk on bare pavement in the area. For the next decade the tunnel sat mothballed and unused, to be reclaimed by the landscape. Yet in the mid-1960s, the state highway department constructed an additional two traffic lanes along the water-level route of U.S. 30 to make it a four-lane divided highway (it was renamed Interstate 80N, then again renamed Interstate 84). In the course of widening the section at the base of Mitchell Point, the department needed to cut back the cliff and scale it of loose debris. This meant, in part, the destruction of the Mitchell Point Tunnel and Viaduct. By 1966, it was gone; only a short section of retaining wall to the west of the viaduct remains.[34]

ENDNOTES

[1]For good syntheses of the Pacific Northwest good roads' movement, see John Kevin Rindell, "From Ruts to Roads: The Politics of Highway Development in Washington State" (M.A. thesis, Washington State University, 1987) and Hugh M. Hoyt, Jr., "The Good Roads Movement in Oregon, 1900-1920" (Ph.D. diss., University of Oregon, 1966); Oral Bullard, *Lancaster's Road: The Historic Columbia River Scenic Highway* (Beaverton, OR: TMS Book Service, 1982): 31; Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 112.

[2]Fahl, "S. C. Lancaster and the Columbia River Highway," 105-07.

[3]John Arthur Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway" (C.E. thesis, University of Washington, 1929): 3.

[4]Samuel C. Lancaster to Amos S. Benson, 7 February 1914, folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem.

[5]Dwight A. Smith, "Columbia River Highway Historic District: Nomination of the Old Columbia River Highway in the Columbia Gorge to the National Register of Historic Places, Multnomah, Hood River, and Wasco Counties, Oregon" (Salem, OR: Oregon Department of Transportation, Highway Division, Technical Services Branch, Environmental Section, 1984): 3.

[6]Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 111; Samuel C. Lancaster, "The Revelation of Famous Highways: A Symposium,"in *American Civic Annual* (n.p., 1929): 109.; see photograph in the Oregon Historical Society collection, negative no. 38744; C. Lester Horn, "Oregon's Columbia River Highway," *Oregon Historical Quarterly* 66, no. 3 (September 1965): 261.

[7]*Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916): 26-30.

[8]*Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916): 26-30. See J. A. Elliott [locating engineer] to John H. Lewis, State Engineer, 3 June 1916, and other letters in folder "552, Wasco County, J. A. Elliott, 1916," box 11, RG 76A-90, Oregon State Archives, Salem.

[9]John Arthur Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway, Oregon" (C.E. thesis, University of Washington, 1929): 3-4; J. A. Elliott, "Report on Columbia Highway, Hood River County, 1914," pp. 1-2, copy from files of Jeanette Kloos, ODOT, Region 1, Portland; Samuel Christopher Lancaster, *The Columbia: America's Great Highway* (author, 1916): 105-06.

[10]"Mitchell Point is Bar to Many Cars on Hood River Trip," *Portland Oregon Journal* (12 July 1995): 3.

[11]Elliott, "Report on Columbia Highway, Hood River County, 1914," 1-2; Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 4-5.

[12]Elliott noted using the cross-section method record to differences in elevation between the base line and ground breaks, but he preferred using true elevations because they were more convenient and "greatly reduced the office work." See Elliott, "The Location and Construction of the Mitchell Point Section o the Columbia River Highway," 5.

[13]"Detailed Reports of Counties," *Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916): 27; Elliott, "The Location and Construction of the Mitchell Point Section o the Columbia River Highway," 15-16, 19.

[14]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 21-22; J. A. Elliott to E. I. Cantine, State Highway Engineer, 17 May 1915, folder "202, Hood River--Mitchell Point, 1915," box 7, RG 76A-90, Oregon State Archives, Salem.

[15]Elliott to Cantine, 17 May 1915; "Blast Covers Rails 20 Feet; Charge for Crag on Highway Blows Earth on Track, Stops Trains," *Portland Oregonian* (11 May 1915) clipping in folder "202, Hood River--Mitchell Point , 1915," box 7, RG 76A-90, Oregon State Archives, Salem. Standifer-Clarkson claimed that the long delay in removing the rubble was the fault of the OWRN because the rail line insisted on using a locomotive crane equipped with an "orange peel," which he believed was inefficient in removing the basalt rubble encountered in the Columbia River Gorge. Standifer added that "the O.W.R.R. & N. laborers were very slow and poorly handled with no effective organization and no apparent realization of the importance of speed in clearing the track, the men in charge seeming utterly helpless and unable to cope with the situation." See G. M. Standifer, Standifer-Clarkson Company, to E. I. Cantine, 25 May 1915, Hood River--Mitchell Point, 1915"; J. P. O'Brien, Oregon-Washington Railroad

and Navigation Company, 31 May 1915; J. P. O'Brien to County Court of Hood River County and Standifer-Clarkson Company, 31 May 1915; A. C. Spencer, Union Pacific System, to State Highway Commission, County Court of Hood River County, and Standifer-Clarkson Company, 9 June 1915; J. R. Holman to County Court of Hood River County, Oregon State Highway Commission, and Standifer-Clarkson Company, 9 June 1915; J. F. Clarkson, Standifer-Clarkson, Company, to J. R. Holman 10 June 1915; John H. Lewis, State Engineer, by E. I. Cantine, to J. R. Holman, 14 June 1915; and A. C. Spencer to Standifer-Clarkson Company, 12 July 1915, folder "202, Hood River--Mitchell Point, 1915," box 7, RG 76A-90, Oregon State Archives, Salem. Only one serious accident happened on the job during the cutting and subsequent cleanup on May 1915. According to Elliott, during one of the blasts, one hole failed to fire, and "in cleaning it the charge exploded, lifting one man into the air and dropping him 140 feet in a mass of rock. Strangely, the man was not killed, but he was badly broken up." See Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 23.

[16]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 22-25; J. A. Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 1, attached to J. A. Elliott to E. I . Cantine, 22 November 1915, folder "210, Mitchell Point Section, Hood River County, 1915," RG 76A-90, Oregon State Archives, Salem..

[17]Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 2; Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 25-26.

[18]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 26-28; Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 2.

[19]Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 2-3.

[20]Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 106; Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 16-17.

[21]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 16-17.

[22]Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 2-3; Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 16-17; "Mitchell Point Tunnel a Rare Engineering Feat," *Portland Oregonian* (29 August 1915): sec. 2, p. 9.

[23]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 29-30.

[24]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 31.

[25]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 28-29.

[26]Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway," 32-33.

[27]"Detailed Reports of Counties," *Second Annual Report of the Engineer of the Oregon State Highway Commission*, 27, 29, 81; Elliott, "Report on Mitchell's Point Section of the Columbia River Highway," 3.

[28]Lancaster, *The Columbia: America's Great Highway*, 118.

[29]R. H. Baldock, Oregon State Highway Engineer, to Oregon State Highway Commission, 2 December 1954, copy in "Historic Structure Report With Revisions and Supplement to Appendix E, Mosier Twin Tunnels, Br. 00653, Wasco Co., September 27, 1994," by Glen Thommen, Foundation Engineer, Bridge Engineering Section, ODOT, Salem, hereafter referred to as "Thommen Report."

[30]Baldock to Oregon State Highway Commission, 2 December 1954; R. H. Baldock to Fred Johnson, American Smelting and Refining Co. [ASARCO],19 August 1948, in "Thommen Report."

[31]Baldock to Oregon State Highway Commission, 2 December 1954.

[32]Baldock to Oregon State Highway Commission, 2 December 1954.

[33]"Scenic Tunnels on Gorge Road Said Unsafe," *Portland Oregonian* (8 December 1954): 26; Baldock to Oregon State Highway Commission, 2 December 1954.

[34]"Gorge Lovers Deplore Eclipse of Scenic Road; Age Demands Utilitarian Route," *Portland Oregonian* (7 December 1954): 12;" Old Gorge Route Shows Its Age," *Portland Oregonian*, sec. 3, p. 6.

See "Plans for Proposed Project, Grading and Structures, Cascade Locks--Mitchell Point Section, Columbia River Highway, Hood River County, Oregon, September, 1964, Readv. December, 1964 (revised as constructed, 12-18-72, contract 6541), copy held by Jeanette Kloos, Oregon Department of Transportation, Region 1, Portland, OR.

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## DATA LIMITATIONS

Research materials for the Mitchell Point Tunnel were plentiful. Not only did it receive much press coverage during construction, it was the subject of a graduate degree thesis by its designer, John Arthur Elliott. Official ODOT maintenance records for this structure no longer exist, probably because it was closed over forty years ago and demolished nearly twenty years ago.

## APPENDIX - VIADUCTS

Viaducts, often bridges resting on a series of narrow reinforced-concrete piers or bents and carrying a road over a valley, cleft, or concavity, have many forms on the Historic Columbia River Highway. They were used primarily to keep construction costs down when alternative road alignments meant expensive grading or "developing distance" by building extra lengths of road to maintain a grade no greater that 5 percent.

### FULL VIADUCTS

<u>West and East Multnomah Falls Viaducts (HAER Nos. OR-36-G & OR-36-J)</u>

The road alignment immediately west and east of Multnomah Falls runs between the Oregon-Washington Railroad and Navigation Company main line and a steep mountainside. There were no realistic alternate alignments for the HCRH here because the railroad tracks ran next to the river's edge. Engineers avoided marring the natural landscape wherever possible and often saw the best solution for creating satisfactory alignments was to construct the road on fill behind solid dry masonry retaining walls. However, for the West and East Multnomah Falls viaducts they needed to bridge very steep and unstable slopes that were susceptible to slide action. Even minimal cutting and filling at the toe of these mountainsides, held together by underbrush and timber, might cause rock and debris avalanches to cover the roadway and, probably more importantly, block the railroad's main line.

The West Multnomah Falls Viaduct is 400' in length and consists of twenty 20' reinforced-concrete slab spans. The deck is supported by two parallel rows of 16"-square columns, or bents, 17'-6" apart. The corners were chamfered, both for aesthetic purposes and to eliminate sharp corners prone to chipping. This shape also facilitated removing the formwork. Roadway width is about 18'. The design engineer K. P. Billner included inclined struts between the footings of the inside and outside piers because he saw a need to guard against settling of the upper columns and to achieve greater structural stability. With confidence he believed that they could "carry the weight of the structure." The East Multnomah Falls Viaduct is identical to the West Multnomah Falls Viaduct, except that it is 860'. Both were completed in 1914.

### HALF-VIADUCTS

Engineers designed half-viaducts for several locations on the highway also to skirt hillsides. They were constructed much like viaducts with unequal-length columns, except that the inside bents consisted only of footings and the inside elevations were anchored into the hillsides or masonry walls. Because of the half-viaducts' inconspicuous design, motorists often did not realize that they were not traveling on regular highway pavement with masonry guard rails.

Crown Point Viaduct (HAER No. OR-36-C)

The Crown Point Viaduct (HAEr No. OR-36-C), completed in 1914, is 560' and consists of twenty-eight 20' reinforced-concrete deck slabs. It was a half-viaduct designed to create a 7' sidewalk and curb adjacent to a tightly curved section of the HCRH on a high basalt promontory. Its design also included a 4' concrete outer railing and concrete light standards to illuminate the point at night. Samuel Lancaster saw Crown Point, originally called Thor's Heights for the Norse god of thunder, as a destination for motorists. Here they could see a panoramic view of the Columbia River Gorge and surrounding landscape, and begin their travels through the "waterfalls" section of the route.

Toothrock and Eagle Creek Viaducts (HAER No. OR-36-N)

High above the river, Toothrock and Eagle Creek viaducts (HAER No. OR-36-N) (224') carried the highway around Toothrock, a tall basalt cliff, high above the river before dropping down to Eagle Creek. Their designs differ only in their railing treatment, where Toothrock Viaduct uses a concrete spindle and cap design, Eagle Creek Viaduct uses a masonry rail and concrete cap design. Their purpose was to minimize costs but create sound structures with an aesthetic component. Completed in 1915, they were abandoned in 1937 at the completion of Toothrock Tunnel and a new water-level realignment of the trunk route near Bonneville Dam.

Ruthton Point Viaduct

Ruthton Point Viaduct, completed in 1918, is a 50' structure consisting of three reinforced-concrete deck girder spans (20', 20', and 10') carrying the highway near a promontory west of Hood River. It used a simple standardized concrete railing panel and cap. It was bypassed when the new water-level route for U.S. 30 was completed in the early 1950s. Since then it fell into disrepair, but in the early 1990s, as part of an Oregon Department of Transportation restoration project on the HCRH, Ruthton Point Viaduct was reconstructed to be part of a pedestrian and bicycle accessible trail along once abandoned sections of the route.

Rock Slide Viaduct

The 34' Rock Slide Viaduct, completed in 1920, lies a short distance west of the Mosier Twin Tunnels. The viaduct was probably necessary, rather than a dry masonry retaining wall, because of the unstable nature of the basalt slope. The viaduct's uninterrupted roadway surface and the continuous arched rubble parapet railing made it difficult for travelers to identify the structure from the road. In the late 1940s and early 1950s, the Oregon State Highway Department completed a water-level route for U.S. 30 along the Columbia River. In 1953, it finished the section between Hood River and Mosier and closed the Mosier Twin Tunnels. The portion of the Historic Columbia River Highway from Hood River to the tunnels' west approach, including Rock Slide Viaduct, became part of Hood River County's extensive road system.